

REMARKS

Status of the Claims:

Claims 41 – 69, 71 and 72 are currently pending.

Claims 1 – 40, 70 and 73 are cancelled.

Claims 50 – 67 and 71 – 72 are withdrawn from consideration.

Claim 41 is currently amended. Claims 50, 52, 58, 59, 66 and 67 are withdrawn and currently amended.

Amendments to the Claims:

No new matter has been introduced by way of the claim amendments.

Claim 41 is currently amended to recite that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer. Claim 41 is also amended to clarify that the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer. Support for a bridge may be found in at least original claim 41, paragraphs [0072], [0073] and [0076] and Figure 3. Support for covalent bonding to both the fiber reinforcement material and the polymer may be found in at least paragraphs [0013], [0051], [0060], [0065] and [0075] and Figures 3 and 7.

Withdrawn claim 50 is presently amended in a manner identical to that of claim 41. Support for amended claim 50 may be found in at least the same locations that amended claim 41 finds support. Claim 50 is also presently amended to correct a minor grammatical error.

Withdrawn claim 52 is presently amended to correct a minor grammatical error.

Withdrawn claims 58, 59, 66 and 67 are presently amended to recite covalent bonding in view of the present amendments to claim 50.

I. 35 U.S.C. § 102/103 Rejections Over *Ton-That*

Claims 41, 42, 45 and 47 stand rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, obvious under 35 U.S.C. § 103(a) in view of United States Patent publication 2005/0191490 (hereinafter, *Ton-That*). Office Action page 2, item 2. Applicants respectfully traverse the rejection of these claims in view of the remarks and amendments presented herein.

I.1 Standard of Review

The standard of review for establishing anticipation under 35 U.S.C. § 102 is set forth as follows: "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP § 2131.

For rejections made under 35 U.S.C. § 103(a), all claim limitations must be taught or suggested by the prior art to establish obviousness. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Furthermore, "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness". *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007) citing with approval *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006). Likewise, in issuing rejections under 35 U.S.C. § 103(a), the Examiner must consider an invention and the prior art as a whole in accordance with the requisite *Graham* factual inquiries. M.P.E.P. § 2141; *Ruiz v. A.B. Chance Co.* 69 U.S.P.Q.2d 1686, 1690 (Fed. Cir. 2004).

Furthermore, "[a] rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." M.P.E.P. § 2143.02. Although "[o]bviousness does not require absolute predictability...at least some degree of predictability is required." *Ibid*.

I.2 Examiner's Grounds for Rejection

The Examiner alleges that *Ton-That* teaches a composite material comprising carbon nanotubes, a fiber reinforcement material and a polymer in which the carbon nanotubes chemically bind the fiber reinforcement material to the polymer. The Examiner also alleges that silane functionalization of carbon nanotubes, glass fibers and an epoxy polymer are taught. Office Action pages 2 – 3, item 2.

In response to Applicants' prior remarks of record, the Examiner essentially asserts that it is inherent that *Ton-That* teaches carbon nanotubes chemically bound to the fiber reinforcement material and a polymer or that *Ton-That* suggests the same. Office Action pages 11 – 12, item 8. The Examiner alleges that since *Ton-That* teaches the structural elements of the claimed composite, one of ordinary skill in the art would allegedly expect it to behave in a substantially similar manner to the claimed composite. The Examiner further alleges that since *Ton-That* teaches melt blending or solution polymerization is used to form the composite material taught therein, one of ordinary skill in the art would allegedly expect that the carbon nanotubes would chemically bind with the fiber additives, given that the composite is bound together when formed in a solution or in a melt. In addition, the Examiner alleges that *Ton-That* teaches interface interaction between a nano-material and a polymer matrix, which allegedly corresponds to a polymer chemically bound to carbon nanotubes.

I.3 Claims 41, 42, 45 and 47 Are Not Anticipated or Obvious

Applicants respectfully assert that claims 41, 42, 45 and 47 are not obvious, because *Ton-That* does not teach or suggest all the required limitations of independent claim 41, as this claim presently stands amended. Applicants have amended independent claim 41 to clarify that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer, rather than chemically bound as previously written. Further, Applicants have also amended claim 41 to clarify that the carbon nanotubes comprise a bridge between the polymer and the fiber reinforcement material. As set forth hereinbelow, Applicants respectfully assert that *Ton-That* fails to teach or suggest a composite material in which carbon nanotubes are covalently bound to both a fiber reinforcement material and a polymer, particularly where the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer.

The Examiner's rebuttal of Applicants' remarks of record alleged that a composite that is bound together after processing would be expected to have at least some of the carbon nanotubes chemically bound to the fiber additive. In response, Applicants reiterate that although *Ton-That* may teach covalent bonding of a graft co-polymer to carbon nanotubes and the polymer matrix, this reference is completely silent regarding covalent bonding of any kind to a fiber reinforcement material. Accordingly, there is also no teaching or suggestion in *Ton-That* to the effect that the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer. Applicants prior remarks of record to this effect are reiterated *in toto*. Further remarks demonstrating that *Ton-That* does not teach or suggest covalent bonding to the fiber reinforcement material follow hereinbelow.

The Examiner alleges that *Ton-That's* teachings that the processing of the polymer composites therein by melt blending or solution polymerization is sufficient to accomplish chemical binding to a fiber additive. Applicants respectfully assert that the Examiner has mischaracterized the teachings of *Ton-That*, and there is no inherent chemical binding to a fiber additive. Specifically, *Ton-That* teaches that the epoxy-functionalized graft copolymer taught therein contains a matrix-compatible portion and an epoxy-functionalized portion (see *Ton-That* paragraph [0052]). As taught in *Ton-That*, the epoxy-functionalized portion interacts with the surface and/or modified groups of the nano-reinforcing material (see *Ton-That* paragraph [0056]), and the matrix-compatible portion interacts with the polymer matrix (see *Ton-That* paragraph [0055]). Since the epoxy-functionalized graft copolymer simultaneously interacts with both the polymer matrix and the nano-reinforcing material, there is no means through which the epoxy-functionalized graft copolymer can also chemically interact with the 'other additives' therein (e.g., fiber additives). Stated another way, the epoxy-functionalized graft copolymer of *Ton-That* cannot chemically interact with both a fiber reinforcement material and a polymer via a carbon nanotube bridge, particularly by covalent bonding to both the fiber reinforcement material and the polymer as now required by claim 41, because the epoxy-functionalized graft copolymer lacks the requisite functionality to do so.

In view of the foregoing remarks and amendments, Applicants respectfully assert that independent claim 41 is not anticipated or rendered obvious by *Ton-That*, since all claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or

indirectly from patentable claim 41 and are patentable for at least the same reasons. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, Applicants respectfully request that the Examiner's rejection of claims 41, 42, 45 and 47 under 35 U.S.C. § 102(e)/103(a) be withdrawn.

I.4 Withdrawn Claims 50 – 67, 71 and 72 Are Not Anticipated or Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not anticipated or rendered obvious by *Ton-That*, since all limitations of independent claim 50 are not taught or suggested. Specifically, Applicants have amended independent claim 50 to require that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer material, and the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer material. For at least the reasons noted above, *Ton-That* fails to teach or suggest covalent bonding to a fiber reinforcement material or a carbon nanotube bridge between a fiber reinforcement material and a polymer material.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not anticipated or rendered obvious by *Ton-That*, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

II 35 U.S.C. § 103 Rejections

II.1.1 Claim 43 Rejected Over Ton-That In View Of Ajayan

Claim 43 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ton-That* in view of Ajayan, *et al.*, "Single-Walled Carbon Nanotube-Polymer Composites: Strength and Weakness", *Adv. Mater.*, 12:2000, pp. 750-753 (hereinafter, *Ajayan*). Office Action page 3, item 3. Applicants respectfully traverse the rejection of this claim in view of the remarks and amendments presented herein.

II.1.2 Examiner's Grounds for Rejection

The Examiner applies *Ton-That* as set forth hereinabove and further alleges that *Ajayan* teaches single-walled carbon nanotubes, which are not taught by *Ton-That*. The Examiner alleges that *Ajayan* teaches epoxy composites containing single-walled carbon nanotubes. The Examiner therefore alleges that it would have been obvious to one of ordinary skill in the art to combine *Ajayan* with *Ton-That* in view of increased composite toughness obtained in doing so.

II.1.3 Claim 43 is Not Obvious

Applicants respectfully assert that claim 43 is not obvious, since claim 41, from which claim 43 depends, is not obvious in view of *Ton-That* and *Ajayan*. Specifically, *Ton-That* and *Ajayan* fail to collectively teach or suggest all of the limitations of amended claim 41. As set forth in detail hereinabove, Applicants have established that *Ton-That* does not teach or suggest a composite material in which the carbon nanotubes are covalently bound to both a fiber reinforcement material and a polymer, particularly as a bridge therebetween. *Ajayan* fails to remedy the noted deficiencies of *Ton-That*, since *Ajayan* is silent on the presence of a fiber reinforcement material. Hence, *Ajayan* also fails to teach or suggest covalent bonding of carbon nanotubes to a fiber reinforcement material.

In view of the foregoing remarks and amendments, Applicants respectfully assert that independent claim 41 is not obvious in view of *Ton-That* and *Ajayan*, since all claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or indirectly from non-obvious claim 41 and are not obvious for at least the same reasons. Therefore, Applicants respectfully request that the Examiner's rejection of claim 43 under 35 U.S.C. § 103(a) be withdrawn.

II.1.4 Withdrawn Claims 50 – 67, 71 and 72 Are Not Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not obvious in view of *Ton-That* and *Ajayan*, since all limitations of amended independent claim 50 are not taught or suggested. Specifically, Applicants have amended independent claim 50 to require that the carbon nanotubes are covalently bound to both the fiber reinforcement material

and the polymer material, and the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer material. As noted hereinabove, *Ton-That* and *Ajayan* fail to teach or suggest these required claim elements.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not rendered obvious by *Ton-That* and *Ajayan*, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

II.2 Claims 44 and 46 Rejected Over Ton-That In View Of Flautt

Claims 44 and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ton-That* in view of United States Patent 6,270,897 (hereinafter, *Flautt*). Office Action page 4, item 4. Applicants respectfully traverse the rejection of these claims in view of the remarks and amendments presented herein.

II.2.1 Examiner's Grounds for Rejection

The Examiner applies *Ton-That* as set forth hereinabove. The Examiner acknowledges that *Ton-That* does not teach silane functionalization of the fiber or resizing with an organosilane species. However, the Examiner alleges that *Flautt* teaches sizing glass fibers with an organosilane species to reduce interfilament abrasion and improve compatibility of the fibers with an epoxy matrix. The Examiner alleges that it would have been obvious to one of ordinary skill in the art to use glass fibers sized with an organosilane, as taught by *Flautt*, in the composite material of *Ton-That*, in view of the decreased interfilament abrasion and improved compatibility.

II.2.2 Claims 44 and 46 Are Not Obvious

Applicants respectfully assert that claims 44 and 46 are not obvious, since claim 41, from which these claims depend, is not obvious in view of *Ton-That* and *Flautt*. Specifically, *Ton-That* and *Flautt* fail to collectively teach or suggest all limitations of amended claim 41. As set forth in detail hereinabove, Applicants have established that *Ton-That* does not teach or suggest a composite material in which the carbon nanotubes are covalently bound to both a fiber

reinforcement material and a polymer, particularly as a bridge therebetween. *Flautt* fails to remedy the noted deficiencies of *Ton-That*, since, at a minimum, *Flautt* is completely silent regarding carbon nanotubes. Furthermore, *Flautt* does not teach or suggest that the organosilane-sized glass fibers are covalently bonded to any type of bridging species, much less a carbon nanotube.

In view of the foregoing remarks and amendments, Applicants respectfully assert that independent claim 41 is not obvious in view of *Ton-That* and *Flautt*, since all claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or indirectly from non-obvious claim 41 and are not obvious for at least the same reasons. Therefore, Applicants respectfully request that the Examiner's rejection of claims 44 and 46 under 35 U.S.C. § 103(a) be withdrawn.

II.2.3 Withdrawn Claims 50 – 67, 71 and 72 Are Not Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not obvious in view of *Ton-That* and *Flautt*, since all limitations of amended independent claim 50 are not taught or suggested. Specifically, Applicants have amended independent claim 50 to require that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer material, and the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer material. As set forth hereinabove, *Ton-That* fails to teach or suggest covalent bonding to a fiber reinforcement material or the claimed carbon nanotube bridge between a fiber reinforcement material and a polymer material. *Flautt* fails to remedy the noted deficiencies of *Ton-That*, since, at a minimum, *Flautt* is silent regarding carbon nanotubes and covalent bonding of organosilane-sized fibers to any type of bridging species.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not rendered obvious by *Ton-That* and *Flautt*, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

II.3 Claims 48 and 49 Rejected Over Ton-That In View Of Phillips

Claims 48 and 49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ton-That* in view of United States Patent 3,312,569 (hereinafter, *Phillips*). Office Action page 5, item 5. Applicants respectfully traverse the rejection of these claims in view of the remarks and amendments presented herein.

II.3.1 Examiner's Grounds for Rejection

The Examiner applies *Ton-That* as set forth hereinabove. The Examiner acknowledges that *Ton-That* does not teach woven sheets or stacking of woven sheets with carbon nanotubes and polymer between them. However, the Examiner alleges that *Phillips* teaches woven mats of glass fiber. The Examiner alleges that it would have been obvious to one of ordinary skill in the art to form the reinforced composite of *Ton-That* using the woven sheets of *Phillips*, motivated by increased dimensional stability.

II.3.2 Claims 48 and 49 Are Not Obvious

Applicants respectfully assert that claims 48 and 49 are not obvious, since claim 41, from which these claims depend, is not obvious in view of *Ton-That* and *Phillips*. Specifically, *Ton-That* and *Phillips* fail to collectively teach or suggest all limitations of amended claim 41. As set forth in detail hereinabove, Applicants have established that *Ton-That* does not teach or suggest a composite material in which the carbon nanotubes are covalently bound to both a fiber reinforcement material and a polymer, particularly as a bridge therebetween. *Phillips* fails to remedy the noted deficiencies of *Ton-That*, since, at a minimum, *Phillips* is silent regarding carbon nanotubes.

In view of the foregoing remarks and amendments, Applicants respectfully assert independent claim 41 is not obvious in view of *Ton-That* and *Phillips*, since all claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or indirectly from non-obvious claim 41 and are not obvious for at least the same reasons. Therefore, Applicants respectfully request that the Examiner's rejection of claims 48 and 49 under 35 U.S.C. § 103(a) be withdrawn.

II.3.3 Withdrawn Claims 50 – 67 and 71 – 73 Are Not Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not obvious in view of *Ton-That* and *Philipps*, since all limitations of amended independent claim 50 are not taught or suggested. Specifically, Applicants have amended independent claim 50 to require that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer material, and the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer material. As noted above, *Ton-That* fails to teach or suggest covalent bonding to a fiber reinforcement material or the claimed carbon nanotube bridge between a fiber reinforcement material and a polymer material. *Philipps* fails to remedy the noted deficiencies of *Ton-That*, since, at a minimum, *Philipps* is silent regarding carbon nanotubes.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not rendered obvious by *Ton-That* and *Philipps*, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

II.4 Claims 68 and 69 Rejected Over Ton-That In View Of Velasco-Santos

Claims 68 and 69 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ton-That* in view of Velasco-Santos, *et al.*, "Chemical Functionalization of Carbon Nanotubes Through an Organosilane", *Nanotechnology*, 13:2002, pp. 495-498 (hereinafter, *Velasco-Santos*). Office Action page 6, item 6. Applicants respectfully traverse the rejection of these claims in view of the remarks and amendments presented herein.

II.4.1 Examiner's Grounds for Rejection

The Examiner applies *Ton-That* as set forth hereinabove. The Examiner acknowledges that *Ton-That* does not teach the specific formula of silane-functionalized carbon nanotubes. However, the Examiner alleges that *Velasco-Santos* teaches carbon nanotubes that are silane functionalized by reacting a hydroxyl group on the nanotube surface with a silane coupling agent. The Examiner alleges that it would have been obvious to one of ordinary skill in the art to

form the reinforced composite of *Ton-That* using the organo-functionalized carbon nanotubes of *Velasco-Santos*, motivated by improved chemical compatibility obtained therefrom. The Examiner further alleges that it would have been obvious to choose a suitable R group to be reactive with an epoxy matrix. The Examiner has also interpreted the product-by-process limitation of claims 68 and 69 to be indistinguishable over that of the cited references.

II.4.2 Claims 68 and 69 Are Not Obvious

Applicants respectfully assert that claims 68 and 69 are not obvious, since claim 41, from which these claims depend, is not obvious in view of *Ton-That* and *Velasco-Santos*. Specifically, *Ton-That* and *Velasco-Santos* fail to collectively teach or suggest all limitations of amended claim 41. As set forth in detail hereinabove, Applicants have established that *Ton-That* does not teach or suggest a composite material in which the carbon nanotubes are covalently bound to both a fiber reinforcement material and a polymer, particularly as a bridge therebetween. *Velasco-Santos* fails to remedy the noted deficiencies of *Ton-That*, since *Velasco-Santos*, at a minimum, does not teach or suggest covalent bonding to a fiber reinforcement material. *Velasco-Santos* only suggests covalent bonding of the carbon nanotubes to the polymer (see *Velasco-Santos*, page 495, Col. 2). *Velasco-Santos* is silent regarding a fiber reinforcement material. Therefore, the cited references as a whole fail to teach or suggest covalent bonding to a fiber reinforcement material.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 41 is not obvious in view of *Ton-That* and *Velasco-Santos*, since all claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or indirectly from non-obvious claim 41 and are not obvious for at least the same reasons. Therefore, Applicants respectfully request that the Examiner's rejection of claims 68 and 69 under 35 U.S.C. § 103(a) be withdrawn.

In addition to the foregoing remarks, Applicants also respectfully assert that the product-by-process limitation of claim 68 yields a materially different carbon nanotube product than that taught by the cited references. Claim 68 requires that the hydroxyl-functionalized carbon nanotubes are formed from fluorinated carbon nanotubes by reacting a reagent selected from the group consisting of a mono-metal salt of a dialcohol, a mono-metal salt of a multi-alcohol, and

an amino alcohol. The structures of such hydroxyl-functionalized carbon nanotubes are illustrated in FIGURES 1 and 2 and are described in more detail in WO 05/028740 (of record, Applicants IDS of November 21, 2007). In contrast, *Velasco-Santos* teaches hydroxyl-functionalized carbon nanotubes that have been surface oxidized to produce hydroxyl groups thereon (see *Velasco-Santos*; page 496, Col. 1, first paragraph and Figure 1 therein). Accordingly, the hydroxyl-functionalized carbon nanotubes of claim 68 and those of *Velasco-Santos* are materially different, since the hydroxyl groups of *Velasco-Santos* are directly on the carbon nanotubes, whereas those of claim 68 are appended to the carbon nanotubes through an alkyl linker species. Furthermore, paragraph [0053] of the instant specification succinctly describes how the presently claimed carbon nanotubes differ from those of *Velasco-Santos*.

II.4.3 Withdrawn Claims 50 – 67, 71 and 72 Are Not Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not obvious in view of *Ton-That* and *Velasco-Santos*, since all limitations of amended independent claim 50 are not taught or suggested. Specifically, Applicants have amended independent claim 50 to require that the carbon nanotubes are covalently bound to both the fiber reinforcement material and the polymer material, and the carbon nanotubes comprise a bridge between the fiber reinforcement material and the polymer material. As noted above, *Ton-That* fails to teach or suggest covalent bonding to a fiber reinforcement material or the claimed carbon nanotube bridge between a fiber reinforcement material and a polymer material. As also noted above, *Velasco-Santos* also fails to teach or suggest either a fiber reinforcement material or covalent bonding of carbon nanotubes thereto.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not rendered obvious by *Ton-That* and *Velasco-Santos*, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

II.5 Claims 68 and 69 Rejected Over Ton-That In View Of Applicants' Specification and Velasco-Santos

Claims 68 and 69 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ton-That* in view of *Velasco-Santos* and Applicants' specification. Office Action page 8, item 7. Applicants respectfully traverse the rejection of these claims in view of the remarks and amendments herein.

II.5.1 Examiner's Grounds for Rejection

The Examiner applies *Ton-That* and *Velasco-Santos* as set forth hereinabove. The Examiner further alleges that Figures 1 and 2 include admitted prior art for hydroxyl-functionalized carbon nanotubes. The Examiner alleges that it would have been obvious to one of ordinary skill in the art to form the reinforced composite of *Ton-That* using the organo-functionalized carbon nanotubes of *Velasco-Santos* made from hydroxyl-functionalized carbon nanotubes of Applicants' specification, motivated by improved chemical compatibility obtained therefrom.

II.5.2 Claims 68 and 69 Are Not Obvious

Applicants respectfully assert that claims 68 and 69 are not obvious in view of *Ton-That*, *Velasco-Santos* and Applicants' specification, since all limitations of amended claim 41 are not taught or suggested by the cited references. As set forth hereinabove, claim 41 is not obvious in view of *Ton-That* and *Velasco-Santos*, and Applicants' remarks to that effect are reiterated *in toto*. Applicants further respectfully assert that the specification does not contain admitted prior art that remedies the deficiencies of *Ton-That* and *Velasco-Santos* in regard to claim 41. Specifically, none of *Ton-That*, *Velasco-Santos* or admitted prior art in Applicants' specification teach or suggest covalent bonding of carbon nanotubes to a fiber reinforcement material, particularly where the carbon nanotubes serve as a bridge between a fiber reinforcement material and a polymer.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 41 is not obvious in view of *Ton-That*, *Velasco-Santos* and Applicants' specification, since all

claim limitations are not taught or suggested. Claims 42 – 49, 68 and 69 depend either directly or indirectly from non-obvious claim 41 and are not obvious for at least the same reasons. Therefore, Applicants respectfully request that the Examiner's rejection of claims 68 and 69 under 35 U.S.C. § 103(a) be withdrawn.

II.5.3 Withdrawn Claims 50 – 67, 71 and 72 Are Not Obvious

Applicants also respectfully assert that withdrawn claims 50 – 67, 71 and 72 are not obvious in view of *Ton-That*, *Velasco-Santos* and Applicants' specification, since all limitations of amended independent claim 50 are not taught or suggested. As set forth hereinabove, none of *Ton-That*, *Velasco-Santos* or admitted prior art in Applicants' specification teach or suggest covalent bonding of carbon nanotubes to a fiber reinforcement material, particularly where the carbon nanotubes serve as a bridge between a fiber reinforcement material and a polymer matrix.

In view of the foregoing remarks, Applicants respectfully assert that independent claim 50 is not rendered obvious by *Ton-That*, *Velasco-Santos* and Applicants' specification, since all claim limitations are not taught or suggested. Claims 51 – 67, 71 and 72 depend either directly or indirectly from patentable claim 50 and are patentable for at least the same reasons.

CONCLUSIONS

Claims 41 – 49, 68 and 69 are presently pending in the application. Applicants respectfully submit that claims 41 – 49, 68 and 69, as these claims presently stand amended, are in a condition for allowance based on the remarks presented hereinabove. Furthermore, Applicants respectfully request that withdrawn method claims 50 – 67, 71 and 72 be considered for rejoinder upon allowance of claims 41 – 49, 68 and 69, as required in MPEP 821.04.

The Director is hereby authorized to charge any fees or credit any overpayment due to Deposit Account Number 23-2426 of Winstead PC (referencing matter number 11321-P074WOUS).


If the Examiner has any questions or comments concerning this paper or the present application in general, the Examiner is invited to call the undersigned at (713) 650-2663.

Respectfully submitted,

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